Trends in the science performance of 9-, 13-, and 17-year-olds

Competence in science is an important outcome of education. The ability to apply scientific information, interpret data, and make inferences about scientific findings is required in a world that relies on technological and scientific advances.

- In 1996, average science performance was higher at all three age levels than in 1982. However, due to declining science scores in the 1970s, scores for 13-year-olds were about the same in 1996 as in 1970 and, for 17-year-olds, were lower in 1996 than in 1970. For 9-year-olds, science performance was higher in 1996 than in 1970.
- In 1996, the average science performance of blacks and Hispanics remained well below that of whites. Nonetheless, the performance gap between whites and blacks at age 9 was smaller in 1996 than in 1970. Between whites and Hispanics at age 13, the gap was smaller in 1996 than in 1977.
- Evidence shows that the difference in science performance scores between the ages of 9 and 13 is similar across racial–ethnic groups, while between the ages of 13 and 17, the change is much greater for white students than it is for black students. For example, on average, white and black 13-year-olds who were assessed in 1990 scored 32 and 30 points higher, respectively, than did 9-year-olds who were assessed 4 years earlier, in 1986. In 1994, however, white 17-year-olds scored 42 points higher than white 13-year-olds did in 1990, while black 17-year-olds scored 31 points higher than their 13-year-old counterparts in 1990.

Average science performance (scale score), by sex and age: 1970–96

	Total			Male			Female		
Year	Age 9	Age 13	Age 17	Age 9	Age 13	Age 17	Age 9	Age 13	Age 17
1970	225	255	305	228	257	314	223	253	297
1973	220	250	296	223	252	304	218	247	288
1977	220	247	290	222	251	297	218	244	282
1982	221	250	283	221	256	292	221	245	275
1986	224	251	289	227	256	295	221	247	282
1990	229	255	290	230	259	296	227	252	285
1992	231	258	294	235	260	299	227	256	289
1994	231	257	294	232	259	300	230	254	289
1996	230	256	296	232	261	300	228	252	292

Average science performance (scale score), by race–ethnicity and age: 1970–96

	White			Black			Hispanic		
Year	Age 9	Age 13	Age 17	Age 9	Age 13	Age 17	Age 9	Age 13	Age 17
1970	236	263	312	179	215	258	—	—	—
1973	231	259	304	177	205	250	—	—	—
1977	230	256	298	175	208	240	192	213	262
1982	229	257	293	187	217	235	189	226	249
1986	232	259	298	196	222	253	199	226	259
1990	238	264	301	196	226	253	206	232	262
1992	239	267	304	200	224	256	205	238	270
1994	240	267	306	201	224	257	201	232	261
1996	239	266	307	202	226	260	207	232	269

— Not available.

NOTE: The science performance scale has a range from 0 to 500. See supplemental table 1-1 for detailed explanations of levels.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Assessment of Educational Progress, *NAEP 1996 Trends in Academic Progress*, revised 1998.

Table S1(a) Standard errors for the first text table in *Indicator 1*

	Total			Male			Female		
Year	Age 9	Age 13	Age 17	Age 9	Age 13	Age 17	Age 9	Age 13	Age 17
1970	1.2	1.1	1.0	1.3	1.3	1.2	1.2	1.2	1.1
1973	1.2	1.1	1.0	1.3	1.3	1.2	1.2	1.2	1.1
1977	1.2	1.1	1.0	1.3	1.3	1.2	1.2	1.2	1.1
1982	1.8	1.3	1.2	2.3	1.5	1.4	2.0	1.3	1.3
1986	1.2	1.4	1.4	1.4	1.6	1.9	1.4	1.5	1.5
1990	0.8	0.9	1.1	1.1	1.1	1.3	1.0	1.1	1.6
1992	1.0	0.8	1.3	1.2	1.2	1.7	1.0	1.0	1.5
1994	1.2	1.0	1.6	1.3	1.2	2.0	1.4	1.2	1.7
1996	1.2	1.0	1.2	1.7	1.0	1.6	1.5	1.3	1.4

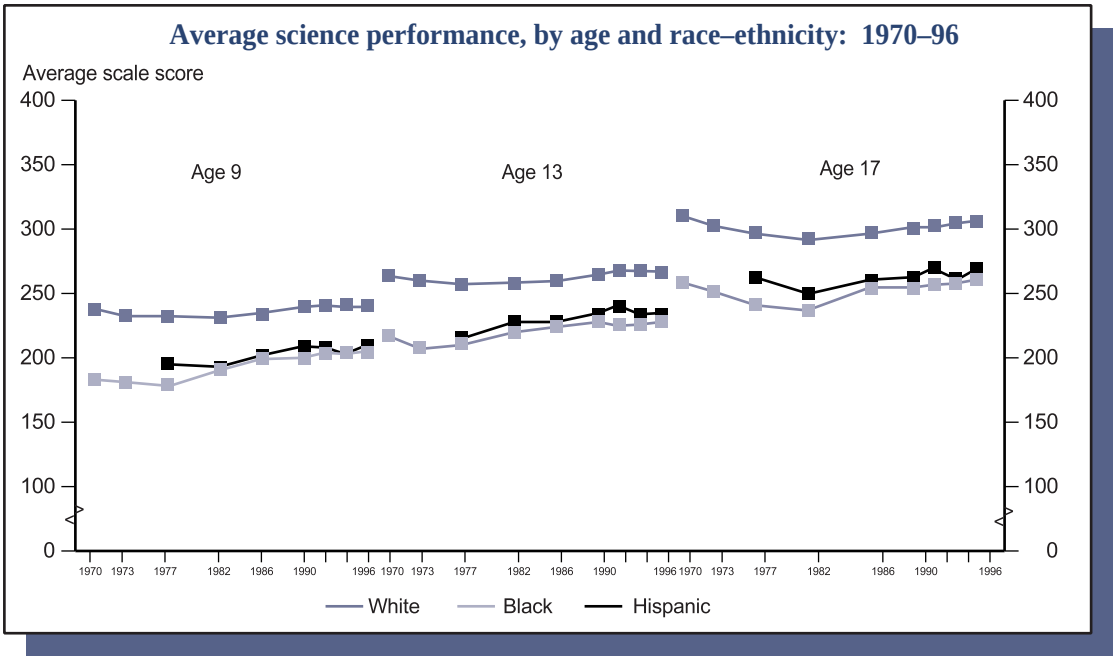
Table S1(b) Standard errors for the second text table in *Indicator 1*

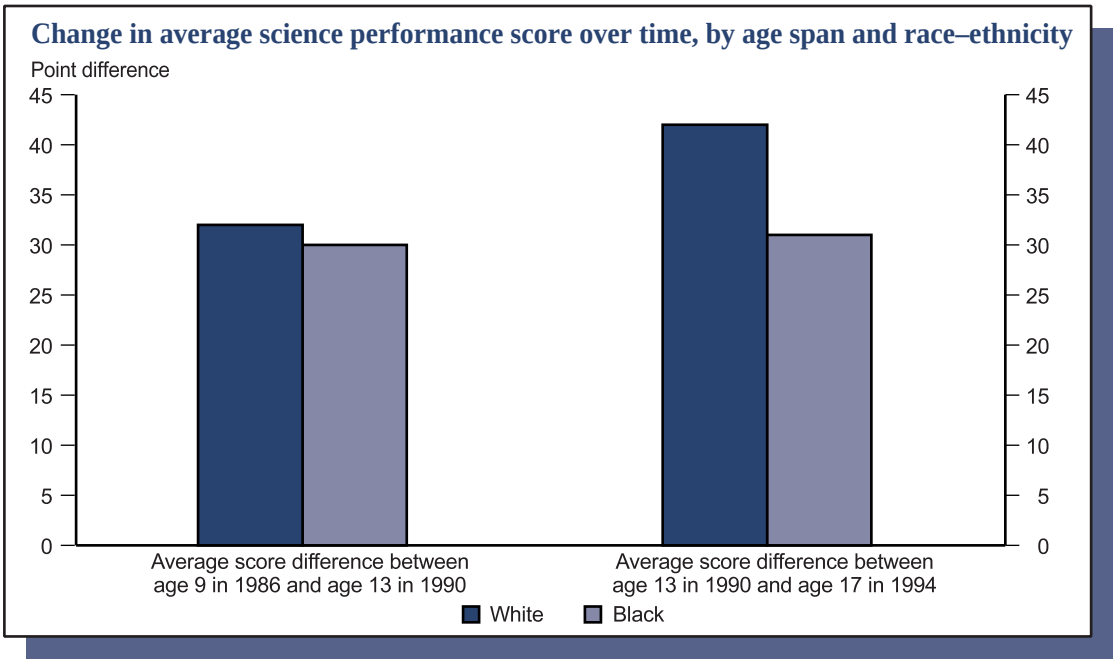
	White			Black			Hispanic		
Year	Age 9	Age 13	Age 17	Age 9	Age 13	Age 17	Age 9	Age 13	Age 17
1970	0.9	0.8	0.8	1.9	2.4	1.5	—	—	—
1973	0.9	0.8	0.8	1.9	2.4	1.5	—	—	—
1977	0.9	0.8	0.7	1.8	2.4	1.5	2.7	1.9	2.2
1982	1.9	1.1	1.0	3.0	1.3	1.7	4.2	3.9	2.3
1986	1.2	1.4	1.7	1.9	2.5	2.9	3.1	3.1	3.8
1990	0.8	0.9	1.1	2.0	3.1	4.5	2.2	2.6	4.4
1992	1.0	1.0	1.3	2.7	2.7	3.2	2.8	2.6	5.6
1994	1.3	1.0	1.5	1.7	4.2	3.1	2.7	2.4	6.7
1996	1.4	1.1	1.2	3.0	2.1	2.4	2.8	2.5	3.3

— Not available.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Assessment of Educational Progress, *NAEP 1996 Trends in Academic Progress,* revised 1998.

Average science performance





NOTE: The science performance scale has a range from 0 to 500. See supplemental table 1-1 for detailed explanations of levels. The data in the second graph are not longitudinal and should not be interpreted as such. For example, students assessed at age 9 are different from students assessed at age 13 or 17.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Assessment of Educational Progress, *NAEP 1996 Trends in Academic Progress*, revised 1998.

Table 1-1 Science achievement levels

Level 150: Knows everyday science facts

Students at this level know some general scientific facts of the type that could be learned from everyday experiences. They can read simple graphs, match the distinguishing characteristics of animals, and predict the operation of familiar apparatus that work according to mechanical principles.

Level 200: Understands simple scientific principles

Students at this level are developing some understanding of simple scientific principles, particularly in the life sciences. For example, they exhibit some rudimentary knowledge of the structure and function of plants and animals.

Level 250: Applies general scientific information

Students at this level can interpret data from simple tables and make inferences about the outcomes of experimental procedures. They exhibit knowledge and understanding of the life sciences, including a familiarity with some aspects of animal behavior and of ecological relationships. These students also demonstrate some knowledge of basic information from the physical sciences.

Level 300: Analyzes scientific procedures and data

Students at this level can evaluate the appropriateness of the design of an experiment. They have more detailed scientific knowledge and the skill to apply their knowledge in interpreting information from text and graphs. These students also exhibit a growing understanding of principles from the physical sciences.

Level 350: Integrates specialized scientific information

Students at this level can infer relationships and draw conclusions using detailed scientific knowledge from the physical sciences, particularly chemistry. They also can apply basic principles of genetics and interpret the societal implications of research in this field.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Assessment of Educational Progress, *NAEP 1996 Trends in Academic Progress,* revised 1998.